Running head: ALTERNATIVE AMBULANCE STAFFING

Executive Development

Consideration of Alternative Ambulance Staffing

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CERTIFICATION STATEMENT

I hereby certify that this paper constitutes my own product, that where the language of others is set forth, quotation marks so indicate, and that appropriate credit is given where I have used the language, ideas, expressions, or writings of another.

Signed:_____

Janice Olszewski

Abstract

Some Emergency Medical Service (EMS) systems use alternative ambulance staffing. The problem is that alternative staffing may affect the quality of patient care. The research purpose was to determine if mixing levels of certification on the first arriving Fire Department of New York Emergency Medical Service (FDNY-EMS) advanced life support (ALS) unit to a critical patient affects the quality of patient care. Other career (paid) EMS systems that have instituted alternative ambulance staffing models were investigated to determine the effectiveness of various models regarding delivery of patient care. Descriptive research was used to answer the following questions (a) why have other agencies implemented alternative ambulance staffing, (b) have other agencies had successful results implementing alternative ambulance staffing, (c) how have other agencies measured success or failure of alternative ambulance staffing, (d) how do ambulance personnel approach the cultural challenges when participating in alternative ambulance staffing? Procedures included questionnaires distributed to career paramedics in the Fire Department of New York (FDNY) and managers of career emergency service departments nationwide to solicit opinions regarding feasibility, efficacy, and success or failure of alternative ambulance staffing. An interview with the Chief of FDNY-EMS was conducted to solicit his assessment of alternative ambulance staffing and conjecture regarding using it in the future for FDNY. Considering the results of the procedures and a review of literature on the subject, the author identified an ALS response model consisting of a unit designated to provide ALS staffed with two members with mixed certification. The recommendation of the first arriving FDNY-EMS ALS unit to a critical patient consisting of one ALS and one basic life support (BLS) member

satisfies recommended standards and parameters regarding pre-hospital response to medical emergencies while considering budget constraints and difficulties recruiting and retaining EMS personnel.

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Consideration of Alternative Ambulance Staffing

There are over 80 different configurations to deliver emergency medical service. The ideal model to deliver quality advanced life support paramedic patient care to life threatening emergencies is a unit with two paramedics arriving first (Ludwig, 2001). Fire services that do not use this response model employ alternative ambulance or like-vehicle staffing combinations. Some fire departments deploy an ambulance with one paramedic and one Emergency Medical Technician (EMT); some deploy a fire engine with a paramedic and Certified First Responders (CFR) on board; others send EMTs with outsourced paramedics to follow.

The problem is that alternative staffing may affect the quality of patient care during life-threatening medical or trauma emergencies. The purpose of the research was to determine the likely effects that alternative staffing has on patient care and to determine which staffing model is most appropriate to meet anticipated demand. Descriptive research was employed to answer the following questions (a) why have other agencies implemented alternative ambulance staffing, (b) have other agencies had successful results with implementing alternative ambulance staffing, (c) how have other agencies measured the success or failure of alternative ambulance staffing, (d) how do ambulance personnel approach the cultural challenges when participating in alternative ambulance staffing?

Background and Significance

The FDNY is a career agency and serves over 8.2 million people over 322 square miles. There are 16,500 employees in the department, comprised of 11,600 uniformed fire members, 3,219 uniformed EMS members (including 300 paramedics), and 1,681

civilian members. There are 221 firehouses and 30 EMS stations in the department. FDNY-EMS responded to over 1.2 million total medical emergencies in 2008. 450,000 of those medical emergencies were considered life threatening. A few examples of life threatening emergency incidents include patients with no pulse and no respirations (cardiac arrest), respiratory arrest, choking, and unconscious. Of patients in cardiac arrest, 1001 of them experienced return of spontaneous circulation (ROSC) (New York City Fire Department, 2008a). The medical certification level designated to respond to life threatening emergencies within a preferred time frame is paramedic. Paramedics provide ALS, which is considered definitive care on the scene.

New York City began dispatching horse and carriage ambulances to citizens in 1870 staffed with a doctor or surgeon from Bellevue Hospital. As call volume grew and if a doctor was not available, the hospital would send any available staff member to respond, for instance an orderly or janitor with no medical training at all. Ambulances responded to over 343,000 calls annually by the 20th century with widely varying levels of staffing (New York City Fire Department, 2008b).

By 1970 the United States Department of Transportation (USDOT) developed guidelines for the training and staffing of ambulances, and all ambulance patient care personnel were upgraded to EMT. In 1974 the first paramedic programs began in New York City. By then New York City had designated its ambulance response system as the New York City Emergency Medical Service (NYC-EMS). By 1977 the first arriving ALS unit to a life-threatening emergency consisted of two paramedics and became the standard in New York City. This configuration continued following the merger with FDNY in 1996 when NYC-EMS became FDNY-EMS (New York City Fire Department,

2008c). A complete tiered response system was in place by 1997 to life threatening emergencies consisting of arrival at the scene by BLS fire engines with firefighter CFRs, then BLS ambulances with two EMTs, and finally ALS ambulances with paramedics.

The CFR program was the first time in FDNY history that firefighters received medical training and implementation occurred (New York City Fire Department, 2008b). EMS EMTs and paramedics in FDNY are given priority from the civil service test list to cross over to train as firefighters, but once they do they no longer operate as an EMT or paramedic in the system in any way and their recertification as an EMT or paramedic is no longer supported by the department in-house. If firefighting members want to maintain their certification as an EMT or paramedic, they must do so on their own time and with their own finances. Firefighters on engine companies are all trained as CFRs, a backward step for the crossover EMTs and paramedics but a certification they must have.

There are 30,185 fire departments in the United States. Of those, 4,306 are career departments; the rest are volunteer departments. Of the 4,306 career departments, 450 provide EMS with ALS (Karter & Stein, 2008).

The National Fire Protection Association's (NFPA) current standard for career fire department EMS response is four minutes or less to a medical emergency by a unit with first responder or higher level. The standard for response time to a medical emergency that requires ALS is eight minutes or less. Both response times are expected to occur not less than 90% of the time. The standard objective is that for an incident that requires ALS, two EMTs and two paramedics must arrive on scene within the suggested time frames (National Fire Protection Association, 2004). It is not specified whether both paramedics have to arrive on the same unit or if they have to be from the same

department. The American Heart Association is in agreement that a basic life support unit or other automatic external defibrillator (AED) equipped unit should arrive to a medical emergency and ALS to a life threatening emergency within the before mentioned time frames (2005 American Heart Association, 2005).

FDNY-EMS has adopted at a minimum the NFPA and American Heart Association standards and has set higher expectations of seven minutes or less for definitive care to arrive at a life-threatening emergency. FDNY has achieved that goal over the last few years, most recently at 6 minutes 39 seconds for fiscal year 2008 (Fire Department of New York, 2008a). Maintaining this high standard is challenging while FDNY-EMS call volume is increasing as the population ages and grows, stretching existing paramedic resources thin, a resource that is difficult to recruit and retain. Adding to the challenge is the current economic deterioration resulting in severe budget cuts.

Budget, recruiting, and retaining paramedics have influenced staffing decisions made by many career fire departments that provide medical service. National and international trends point toward alternative staffing to confront the contemporary issues. Quality and timely definitive patient care is the goal of FDNY-EMS and it has attained that with the two paramedics per ambulance model as the first arriving ALS unit. However, FDNY has also been put in the position of exploring alternative ambulance staffing models to maximize resources while maintaining quality patient care and affordability.

Consideration of alternative staffing by FDNY may maintain the standards set by the department without sacrificing quality of definitive patient care delivered. It may reduce costs to the department, increase available paramedic resources, and advance the

alliance between EMS and fire suppression members. It may further initiatives outlined in the 2007-2008 FDNY Strategic Plan in which the New York State Department of Health (NYSDOH) approved that the department could staff a non-transport vehicle with one paramedic and one EMT (Strategic Plan Work Group, 2007).

FDNY for over 100 years prior to merging with FDNY-EMS had been a single discipline service consisting of fire suppression, fire prevention, and fire investigation. The introduction of EMS into the department was a huge impact on the firefighters who not only had to interact with the culture and behavior of EMS providers, but also had to train and provide first aid via the CFR program (New York City Fire Department, 2008b).

EMS has also been rigid with the structure of EMTs working with EMTs only and paramedics working only with paramedics on an ambulance. The prospect of alternative staffing with possibilities of EMTs working with paramedics or firefighters working with paramedics on the same unit would be an enormous cultural undertaking, requiring members to adapt and change to affect the successful delivery of patient care. This relates to Unit 7 in the Executive Fire Officers Program Executive Development Course emphasizing strategies and initiatives to boost cooperation between stakeholders when confronting organizational change and cultural interaction (National Fire Academy, 2006).

One of the five operational objectives of the United States Fire Administration (USAF) is to respond appropriately in a timely manner to emerging issues (United States Fire Administration, 2009). Consideration of alternative ambulance staffing addresses the

current economic condition in the United States and a growing and aging population that demands EMS resources, and that those resources are able to provide quality patient care.

Literature Review

A literature review was conducted to provide a summary of findings of other studies and agencies as it relates to alternative ambulance staffing. Many managers of fire departments that provide EMS are struggling to deploy appropriate resources to life threatening incidents with limited financial means and hard to recruit and retain paramedic positions available.

Studies of EMS providers began comparing basic life support (comprised of CFR and EMT levels of training) to ALS paramedic response to cardiac arrest and other medical emergencies by the 1970s. Although resources were not difficult to find regarding the topic, a common lament among researchers was that not enough studies have been done to determine definitively which configuration of response to life threatening emergencies is most effective or even if the efficacy of paramedic care is substantial enough to impact chances of survival.

Summarizing the national model for emergency medical personnel training (National Emergency Medical Service, 2007), a CFR on average receives 60 hours of training, an EMT 110 hours, and a paramedic 1100 hours. The bridge between CFR and EMT regarding training and skills sets is not wide, but paramedic training includes many more hours and skills capabilities (see Appendix A). CFRs in a three-tiered response arrive first, filling the gap between incident notification and time of arrival of the first EMT unit, and then a paramedic unit follows.

EMT scope of practice has recently started to include additional interventions that were previously confined to paramedic care only. The Regional Emergency Medical Advisory Committee of New York City (REMAC) allows for EMTs to administer medications to patients. EMTs in New York City can now give aspirin to cardiac patients (Regional Emergency Medical Advisory Committee of New York City, 2006a) and albuterol to asthma patients (Regional Emergency Medical Advisory Committee of New York City, 2006b).

A lot of time and money has been spent developing ALS programs without much information regarding validating the efficacy of ALS scientifically. Studies to determine the value of ALS intervention have been difficult due to the obstacles to accurate research; there is no centralized repository of EMS-related publications therefore poor data resources, and patients are in EMS care for such a short time as to inhibit detailed examination (Bissell, Eslinger, & Zimmerman, 1998). It is difficult to quantify what proportion of EMS incidents are true emergencies, making data collection practically impossible (McDowell, 2002).

EMS is slowly moving ahead with standardized data collection. The National Emergency Medical Information System (NEMSIS) is coordinating all 50 states to opt into an agreement with the National Highway Traffic and Safety Administration (NHTSA) data set and its implementation. The program needs 100% compliance among EMS providers and the second step is to link with hospitals to collect data on final patient outcome. Without this kind of program, it is difficult to determine the value of any level of pre-hospital emergency care (Ludwig, 2004). NEMSIS is still working to fully

implement the program but now has all 52 states and provinces agreed to participate (National EMS Information System, 2007).

Variables that further establish an uneven playing field that complicates evaluation include urban versus rural response areas, time gap between patient onset of problem to 911 notification, and bystander intervention. Additional factors include the myriad of health emergencies, differences in skill levels of paramedics and equipment used, and the considerable difference in each patient's predisposition that may affect survivability. The lack of definitive and consistent conclusions in the studies plus additional factors such as budget concerns make decisions and measurability regarding the manner of providing EMS by managers challenging.

Bissell et al. (1998) concede that impeding variables mentioned earlier have a considerable impact on patient disposition and emphasize that a tiered response that includes CFR, EMT, and then paramedic intervention in a timely fashion is critical. This type of response drove Cummins, Ornato, and Thiess (1991) to develop the concept of the chain of survival. The chain of survival includes recognizing early warning signs, activating EMS, early cardiopulmonary resuscitation (CPR), early public access or basic life support defibrillation, and early ALS. Breaking any links in this chain reduces chance of survival. Bissell et al. note that the chain of survival concept was approved and adopted by the American Heart Association in 1990 and remains the cornerstone of its guidelines.

Cummins, Eisenberg, and Horwood (1990) studied cases of patients in cardiac arrest in 31 locations. They found that there was a 16% survival rate in systems that employed only EMTs trained in automatic external defibrillator use, a 29% survival rate

in systems that employed EMTs with automatic external defibrillator and paramedics, but only a 17% survival rate with systems that used paramedics only with a later time of arrival, almost identical to the EMT only systems.

Eitel, Walton, and Guerci (1988) performed a six-year study of patients in out-of-hospital cardiac arrest in York and Adams Counties, Pennsylvania. They found that optimum chance for survival in concepts of time was basic life support arrival within 4 minutes and ALS arrival within 10 minutes, emphasizing that time to definitive care is critical and the best predictor of success.

The Ontario Prehospital ALS (OPALS) study is to date the largest study ever done worldwide to examine prehospital efforts of emergency care providers. It was a clinical trial conducted between 1994-2002.

Part I of the study was to determine the effectiveness of ALS in patients in cardiac arrest and the effectiveness of ALS for patients with other serious medical illness. Part I examined 5,600 patients in cardiac arrest across 20 cities in Ontario, a jurisdiction of 11 million people. Part II of the study examined ALS in patients with major trauma. Up until this study the incremental benefit of ALS had never been established for out-of-hospital cardiac arrest let alone other life threatening medical conditions (Steill, 2005).

Steill and Wells (2004) conclusions following the OPALS study Part I were that there is no benefit to the rate of survival (discharge from hospital) of out-of-hospital cardiac arrest victims from ALS. Traditional ALS procedures such as advanced airway placement and medication delivery, according to the study, did not lead to an increase in survival. The OPALS study explained that basic life support performing effective CPR and rapid defibrillation programs were as successful to the patient as ALS intervention in

pre-hospital cardiac arrest. However, Part I also showed that ALS intervention produced a lower mortality rate for respiratory distress and other serious medical illnesses (Steill, 2005).

Part II of the study concluded that full implementation of ALS for major trauma patients did not reduce mortality rates relative to basic life support intervention (Steill, 2008). Ludwig (2004) points out that the OPALS study had admitted limitations. Regarding cardiac arrest it did not examine urban areas with denser populations and a higher probability of bystander CPR and faster ALS response, and it did not examine extremely rural areas where the transport to the hospital is usually lengthier and ALS on the ambulance may be invaluable.

Existing evidence that ALS is a worthy investment of money and training has career agencies that provide EMS striving to provide paramedic care, but not without obstacles. New York City Mayor Michael Bloomberg announced budget cuts in September 2008 for major city agencies secondary to recent economic downturns. FDNY's current annual budget is 1.35 billion dollars. FDNY budget cuts announced for 2009 were 33.8 million and for 2010 68 million, 2.5% and 5.0% of the budget respectively (Lisberg & Lombardi, 2008). FDNY Chief of Department Salvatore Cassano recently updated those figures in December 2008, asked by the mayor to increase the amount to 96 million in budget cuts by 2010 (S. Cassano, personal communication, December 10, 2008).

A number of studies examined the cause and effect of limited financial means on fire departments. Start up costs in 2005 for an ALS program were about $48,000 per 100,000 residents and $70,000 per life saved (Steill, 2005). Fire departments are

impacted by a slumping economy by having to maintain all necessary components of a service in addition to staffing including physical plant, logistic, and support functions. Those components include funding gasoline, electricity, propane, water and sewer fees, and maintaining apparatus. Training and maintaining paramedics and attempting to maximize patient care by deploying multiple paramedics on the first arriving ALS unit may be prohibitive financially. Many agencies have had to examine the cost benefit of that response model. Health care benefits for employees are soaring and having to downsize them loses them as a retention tool, and comparatively lower salaries for a highly trained and skilled employee also impacts retention (Wilson, 2008).

Well before any economic inconsistencies, municipal EMS systems had problems hiring and retaining paramedics. Chief of FDNY-EMS John Peruggia reinforces that the titles of EMT and paramedic are difficult to recruit and costly and lengthy to train and maintain. Chief Peruggia, adding that the poor economy is having a greater impact on decision making, said that alternative staffing may be a possibility in the future for FDNY and has already received approval to do so but it has not been addressed yet during union collective bargaining with New York City Labor Relations (J. Peruggia, personal communication, January 21, 2009).

Frequently paramedics leave their EMS career to pursue more lucrative positions such as nursing and physician assistant. The average mean salary in the United States for a paramedic is $53,000 (United States Department of Labor, 2007). FDNY paramedic starting salary is $37,346 and after 5 years tops out at $50,501 (New York City Fire Department, 2008d). Paramedics endure taxing working conditions that decrease motivation to continue with a career that does not financially compensate adequately.

With staffing shortages comes mandatory overtime that in addition to spontaneously altering one's after-work commitments may lead to burnout. Strenuous lifting and carrying patients up and down stairs and in and out of ambulances produces neck, back, and shoulder injuries. Shortages of paramedics bleeds across disciplines; fire departments are sometimes forced to staff ambulances with firefighters who are cross-trained as paramedics, reducing the number of firefighters on fire apparatus responses (McDowell, 2002).

Conversely, some agencies send fire engines with cross-trained medical personnel to supplement EMS response to incidents, but this measure may compromise fire response and cut into firefighter training, pre-planning, rehabilitation, and maintaining physical fitness (McDowell, 2002). Some agencies have eliminated special operations units such as rescue or hazardous materials units to staff ambulances appropriately. These measures may lead to unsafe working conditions for members and reduce service to local communities. Unions become unhappy at the perceived increase in danger, as departments are unable to comply with NFPA guidelines (Ross, 2007).

Pressures to recruit and support a paramedic program are significant as the population ages and grows and demand increases. Paramedics are leaving a field they may be gratified by but cannot remain with due to proportionally low pay, lack of promotional opportunities, and excessive workload. Chief Peruggia feels it is difficult to retain EMTs and paramedics on the EMS side of FDNY for two primary reasons; one is that prospective firefighters, who never wanted to perform medical tasks, join the department as an EMT or paramedic to take advantage of the practice that EMS members receive priority to cross over to fire suppression when positions are available in

suppression; the second reason is that dedicated EMTs and paramedics would like to remain with EMS but cross over for the higher salary of suppression members (J. Peruggia, personal communication, January 21, 2009).

Motivation to enter into a health care system is hampered by the perception that the health care system is broken. In addition to less than exemplary pre-hospital working conditions, emergency departments are overcrowded, healthcare premiums are very high, and morale and recognition are low for EMS first responders. Pop culture may be producing recruits with television programs such as *Rescue Me* and *Third Watch*, but agencies are looking for quality versus quantity in recruiting efforts (Evans, 2005).

Erich (2008) found that Victoria, Australia has a system that attracts and retains paramedics. They packaged good working conditions, training, a starting $50,000 salary plus overtime that could double that salary, and 10 weeks paid vacation. Victoria still has staffing shortages due to demand, but their program is so attractive they actively recruit paramedics from oversees to fill positions. Erich notes though that throwing money at the problem is not always the answer. Pre-hospital emergency care is actually valued in Australia as compared to the United States. It is supported by the state and young people hold it in esteem.

Investigating cultural and personal feelings of paramedics and agency directors, researchers found that paramedics prefer two members per unit while managers and financial officers prefer one. Arguing for the two paramedic model, a paramedic working on scene with a lower certified member is held solely responsible for all medical treatments and that they are safe and therapeutic (National Emergency Medical Service, 2007). Two paramedics arriving first and together creates an atmosphere of checks and

balances and is better for patient care because it increases the chances for successful advanced procedures (Ludwig, 2005). Ludwig notes however that he discovered that Melbourne, Australia on-scene times were 15.54 minutes when an ALS member worked with a basic life support member and 16.92 minutes on scene when two paramedics work together. Evans (2005) notes that most standards do not justify two paramedics per ambulance and that there is little science to indicate more than one medic on one response vehicle. Agency heads that choose alternate staffing models justify doing that from such evidence but are also influenced by factors that include finances.

A questionnaire offered to FDNY paramedics supports that paramedics prefer the two-paramedic model (see Appendix B). Chief Peruggia offered that since it has been EMS tradition to staff ambulances with two paramedics, the paramedics feel this is the way it should remain for optimum patient care and any other configuration would downgrade that. Chief Peruggia adamantly suggests that any alternative staffing configuration model attempted by FDNY should be a limited pilot project to evaluate response data, impact on providers, and impact on quality of patient care (J. Peruggia, personal communication, January 21, 2009). A questionnaire offered to fire department managers nationwide supports alternative staffing models (see Appendix C).

In summary, the literature resources revealed that agencies are opting for alternative staffing due to budget constraints and difficulties recruiting and retaining paramedics. The data available indicates that paramedic care is an effective and viable patient care program for some medical applications despite measurability difficulties, but standards, science, and most agency resources do not support two paramedics on the first arriving ALS unit as mandatory.

Procedures

Descriptive research was the method used to investigate and recommended an ambulance-staffing model most appropriate for FDNY. Two questionnaires and an interview were used to gather feedback to address the research questions.

The first questionnaire was distributed to FDNY paramedics and the format was close-ended multiple-choice style. The questions were formatted in the Likert, or agreement scale style with lines for comments at the end. Appendix B displays the questions and results. A cover letter was included explaining the reason for the questionnaire, how it could contribute to EMS models, due date, and that it would be anonymous (see Appendix D). It was distributed to 60 FDNY paramedics for their opinion and experience with alternative ambulance staffing to assist with the research question regarding probable cultural conflict.

The questionnaires were one double-sided typewritten page distributed via intra-office mail in manila envelopes with each paramedic's name and work location typed on the outside. A return envelope was included with the author's rank, name and return address typed on it. The 60 paramedics represent 20% of the 300 paramedics employed by FDNY. Thirty-two questionnaires were returned, representing approximately 10% of the 300 paramedics. The questionnaire provided the same questions to two different groups of paramedics: those who had experience working with a lower certified member outside of FDNY and those who did not.

The second questionnaire was on-line and close-ended multiple choice, meant for managers of career or mostly career fire departments for feedback to apply to all the research questions. Some questions allowed for additional comments from questionnaire

participants. The questionnaire was developed on a pay-for-use questionnaire builder site on the Internet called Survey Monkey at surveymonkey.com. The questions and results are listed in Appendix C. There was an option that the questionnaire could be anonymous, but most agencies provided their agency name and location. An agreement was included upon signing up for using the site that no questionnaires could be delivered electronically unsolicited.

The author sent e-mail to managers of 150 of the approximately 450 career or mostly career fire departments in the United States that purported to provide EMS with ALS, inviting them to participate in the questionnaire. The e-mail addresses were retrieved from the Firehouse Network section on the Firehouse.com Internet website. If they replied they were willing to participate, the link to the questionnaire was e-mailed to them. The questionnaire was an instrument to poll the managers to determine if they employed alternative ambulance staffing, how they measured the success of it, why they chose an alternate model, and how the employees involved felt about alternative staffing.

Of the 150 fire departments that were contacted, 43 replied to the e-mail invitation that they would participate. The questionnaire was also posted on the National Society of Executive Fire Officers Internet website at nsefo.org. The website invited students to contact the site administrator via e-mail requesting that their questionnaire link be posted. When it was approved, the questionnaire link was posted with a brief description of the content and an invitation to access it. Seven participants responded via the website for a total of 50 respondents to the on-line questionnaire, or 11% of career or mostly career fire departments in the United States that provide EMS with ALS. Appendix E lists the respondents to the on-line questionnaire.

Chief of FDNY-EMS Command John Peruggia was interviewed in person on January 21, 2009, at 10:00am at FDNY headquarters at 9 Metro Tech Center, Brooklyn, New York. A series of questions was asked to ascertain Chief Peruggia's opinion of alternative ambulance staffing and if he saw it as an option for FDNY and how that could be accomplished. Appendix F is a list of the interview questions. The interview added insight into investigation of the research questions addressing reasons why agencies chose alternative staffing and its impact on organization culture.

One of the limitations of the study was that assessment of the efficacy of advanced life support is not consistent or definitive. Without quantitative data to analyze, the decisions to use alternative ambulance staffing or to even provide advanced life support at all are complicated. There was no limitation on available information but the studies reviewed varied widely in their conclusions and at times were in direct conflict with each other.

Another limitation of the study was the somewhat disappointing response rate to the on-line questionnaire for fire department managers. The stipulation that the questionnaire was not to be e-mailed unsolicited produced a cumbersome process that entailed first e-mailing agencies for agreement to answer the questionnaire and permission to e-mail them the link. In addition, no other agency in the United States equals the size of FDNY in personnel, apparatus, or number of responses to incidents, making it difficult to correlate the responses to the operations of FDNY.

The questionnaire for FDNY paramedics was limited in that the answers the paramedics gave were opinions not based on any quantitative reference. The paramedics may also have been biased to give negative opinions of the prospect of alternative

staffing because they are aware that it is a trend and under consideration by the department.

Results

Why have other agencies implemented alternative ambulance staffing?

The literature review revealed that career fire departments that provide EMS implement alternative ambulance staffing for several reasons. It is expensive for departments to maintain a paramedic program. Training, salaries, and equipment for ALS costs relative to basic life support costs are higher (Steill, 2005).

Expensive as an ALS program is, even so paramedic salaries are not competitive with other careers that require advanced training and skills within and outside the health field. Recruiting and retaining paramedics in fire departments is challenging. For comparatively low salaries paramedics work long hours in a physically demanding job, experience hazardous working conditions, gain little recognition resulting in low morale, and have limited advancement opportunities (McDowell, 2002).

Analyzing a questionnaire for managers of career fire departments that provide EMS ALS (see Appendix C), the results showed that 67% of the departments use alternative ambulance staffing on their first arriving ALS unit; a paramedic responding with a lower certified member. In answering a question regarding why their department employed alternative staffing, which allowed for multiple answers, budget concerns resulted in 36% of the departments opting for alternative staffing, while difficulty recruiting and retaining paramedics combined for 34%. Sixty percent of the respondents cited other or additional reasons that their department uses alternative staffing including

that most of the incidents they respond to are basic life support emergencies, and that additional paramedics arrive later during the incident from within their department.

Chief Peruggia echoed that FDNY might consider alternative ambulance staffing due to budget concerns and the difficulties recruiting and retaining paramedics. He also cautioned that the annual increase in incidents FDNY-EMS responds to creating paramedic demand might also sway the decision. (J. Peruggia, personal communication, January 21, 2009).

Have other agencies had successful results implementing alternative ambulance staffing?

The questionnaire for the managers (see Appendix C) asked how successful they considered their operation that uses alternative ambulance staffing regarding delivery of quality ALS. An overwhelming 84% considered alternative staffing a successful combination of basic life support working with ALS treating patients who require ALS. No comments in the boxes provided for some questions contributed to the pertinence of the questionnaire.

The literature review on the issue of success of alternate ambulance staffing revealed the underlying question of whether there is enough value to ALS as a positive medical emergency intervention in the first place. Bissell, Eslinger, & Zimmerman (1998) came to the conclusion that ALS was useful in most applications but stressed that maximum patient survivability is contingent on the pretext that the chain of survival is effectively attenuated. Cummins, Eisenberg, and Horwood (1990) found that patient survivability increased when ALS was available with cardiac arrest patients and other critical medical emergencies if ALS was provided in a timely manner. The OPALS study

found that ALS was no more beneficial than basic life support when cardiac arrest or trauma was the emergency (Steill, 2008).

Very little was found in the literature review that the success and quality of ALS and perhaps therefore alternative staffing depended on the presence of two paramedics on the first arriving ALS unit. The priority seemed to be trying to determine what data to compile regarding ALS intervention and how to interpret it over what staffing configuration paramedics should arrive in. National standards and guidelines reviewed do not mandate or suggest that two paramedics are to be on the first arriving ambulance unit to life threatening emergencies (National Fire Protection Association, 2004).

The questionnaire distributed to FDNY paramedics (see Appendix B) showed that 46% of paramedics who had worked with a lower level certified member outside the department agreed or strongly agreed that alternative staffing leads to an adverse affect on patient care. An additional 31% remained neutral on the subject. Paramedics who did not have experience working with a lower certified member resulted in 84% of them feeling that the prospect of combined certifications may have an adverse affect on patient care while 5% were neutral.

How have other agencies measured success or failure of alternative ambulance staffing?

Biessell, Eslinger, & Zimmerman (1998) and Ludwig (2004) were frustrated as to how ALS can be measured definitively. They discussed response times to the patient, on-scene times, final patient disposition, and successful completion of ALS interventions as fractal or packaged elements to consider success of paramedic care. Ludwig considers the

activation of the National EMS Information System critical to definitive agency measurement of their staffing configurations.

The on-line questionnaire of department managers (see Appendix C) indicated that they measured the effectiveness of alternative staffing by way of customer feedback, employee feedback, and data from responses to emergencies. From a management perspective, 84% of respondents indicated that with or without formal evaluation they believe that alternative ambulance staffing is a viable option for delivery of quality ALS.

How do ambulance personnel approach the cultural challenges when participating in alternative ambulance staffing?

The organization cultural challenges that alternative ambulance staffing may produce was not evident in the literature review. When NYC-EMS was combined with FDNY in 1996, New York City firefighters and medical members were thrust into a relationship that is still developing. The prospect of firefighters and EMTs or paramedics combined on the same vehicle or a paramedic paired with an EMT on the same vehicle would be unprecedented and may affect the working relationship between those participating in alternative ambulance staffing.

The questionnaire distributed to FDNY paramedics (see Appendix B) showed that 54% of paramedics who had worked with a lower level certified member outside the department disagreed or strongly disagreed that cultural differences would stand in the way of a strong working relationship. An additional 23% remained neutral on the subject. In support that paramedics with experience with an alternative model feel less reluctant to acquiesce to the concept, the agency managers answered 76% of the time that they felt

their paramedics were comfortable with alternative staffing (see Appendix C). Continuing with the FDNY paramedic survey (see Appendix B), paramedics who did not have experience working with a lower certified member thought the opposite of the prospect of doing so; 68% felt working with a firefighter or lower certified member would be problematic. Both groups were very close regarding maintaining their personal confidence level when working alone as an advance life support provider; 39% of paramedics with experience working with a lower certified member felt they were as confident while 31% were neutral, while 37% of those without experience felt they would be as confident and 21% were neutral.

Three paramedics wrote comments in the space available for additional thoughts. The first wrote without two paramedics there was nobody to bounce ideas off of; the second wrote if one paramedic was not successfully performing an intervention, the other could try, and the third wrote that as a new paramedic they appreciated another paramedic to work closely with, but upon gaining experience would feel comfortable working with a BLS member.

Chief Peruggia was extremely firm in his belief that the department's medical and firefighting members need more time to acclimate to the merger itself and cross-discipline training before they can culturally co-exist on the same unit. He had a better outlook that EMTs and paramedics could work together on the same unit sooner (J. Peruggia, personal communication, January 21, 2009).

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Discussion

The study results suggest that ALS is a valid and effective program to include in fire departments that provide EMS with ALS. Most studies and opinions concluded, although not emphatically or justified by standardized or consistent scientific data or even what data to concentrate on, that paramedic interventions may be an important link in the sequence of care for patients experiencing out-of-hospital medical emergencies. No studies examined spoke directly to staffing configurations of the first arriving ALS unit, but other standards, articles and opinions did.

The largest study to date, the OPALS study, concluded that ALS made no difference in the survivability of patients in pre-hospital cardiac arrest or major trauma, but does increase patient outcome in other major medical emergencies such as respiratory distress (Steill, 2005). Ludwig (2004) pointed out that no one study conclusion, including the OPALS study, is wholly representative of all geographic and demographic considerations and therefore may be unintentionally skewed toward producing limited results.

The success of ALS was qualified by many factors, including that the timeliness of the intervention was critical to patient outcome (Cummins, Ornato, & Thiess, 1991). Eitel, Walton, and Guerci (1988) also found nearly 20 years ago that time to arrival of any pre-hospital care to the patient is the critical factor in patient survivability.

Wilson (2008) suggests that ideal staffing of ALS units are impacted by costs and a hard-to-recruit and retain profession, implying that staffing the first arriving ALS unit with two paramedics may be a luxury not affordable in the current economic climate.

Walker concludes that agencies have to adjust by using alternative ambulance staffing models.

Predictably, as stated by Ludwig (2005), managers prefer one paramedic per ambulance because it's cheaper, and paramedics prefer two to maintain a system of checks and balances and to make up for each other's shortcomings. The manager questionnaire overwhelmingly approves alternative staffing as a viable option (see Appendix C). The majority of FDNY paramedics, steeped in the tradition of two paramedics working together, do not support alternative staffing as an option (see Appendix B).

The concept of alternative ambulance staffing is supported based on the results of the study. The study can justify that ALS programs, although difficult to measure, are an asset to EMS systems and invaluable in many applications. Even if ALS is effective in certain applications, it maximizes the survivability chances of every single patient in critical condition. Steill (2005) via the OPALS study concluded that paramedic interventions were no more effective for the cardiac arrest application than good CPR delivered by basic life support, yet the tiered system employed by FDNY including ALS produced 1001 ROSC of patients in cardiac arrest in 2007, a survival rate increase of 18% over 11% ROSC in 2006 (Fire Department of New York, 2008a).

New York City paramedics are highly trained, highly skilled and respond to hundreds of assignments daily citywide (Fire Department of New York, 2008a). No previous study can match the patient volume and types of emergencies FDNY paramedics encounter. This continuity of patient care enables them to repetitively hone their patient assessment and therapeutic intervention skills, possibly producing a higher

ratio of patient survivability than the results produced by other studies in other areas. FDNY paramedics have been tasked with ever-increasing new skills and responsibilities, for example respiratory monitoring via capnograpy, and EKG interpretation resulting in expedition of patients to cardiac catheter labs for rapid treatment. Soon they will be inducing hypothermia in post-cardiac arrest patients to ensure continued stability (National Emergency Medical Service, 2007).

The study concedes that two paramedics per first arriving ALS unit to a life-threatening emergency are optimum but increasingly difficult to maintain in today's current financial and EMS system climate. FDNY is not exempt from financial crises and faces severe budget cuts in the next few years (Lisberg & Lombardi, 2008). Coupled with the reality that paramedics are difficult to recruit and retain and frequently go on to higher paying careers almost forces the department's hand regarding better allocation of existing and prospective resources.

Regarding paramedics' years on the job in FDNY, Appendix B demonstrates that paramedics either stay around for the long haul or put in a few years and exit; there is very little middle ground. The study speculates that FDNY paramedics gain a few years experience in the department, perhaps attend school at the same time, and then seek higher compensating, less physically taxing, and higher recognition careers. Because there is a high attrition rate for paramedics in FDNY, and adding to that members on sick leave, educational leave, military leave, etc., the remaining members are forced to work mandatory overtime leading to low morale and burnout.

Another factor is that the line between protocols for EMT and paramedic interventions is blurring. EMTs are now empowered to perform interventions typically

reserved for paramedics, including medication administration (Regional Emergency Medical Advisory Committee of New York City, 2006a). The ability to perform more advanced interventions includes more sophisticated and complex education regarding assessment and recognition of medical emergencies; the EMT is becoming a more subjective practitioner versus a straight clinician. EMTs may be more equipped to communicate symbiotically with a paramedic if they were working together.

Although the questionnaire distributed to FDNY paramedics indicated they do not support the prospect of alternative staffing in FDNY, the majority responded they would feel as confident providing ALS care when working with a BLS member as when paired with another paramedic (see Appendix B). Assuming the EMT and paramedic working together are able and competent, the first arriving unit to an ALS assignment staffed with this configuration should not adversely affect patient care. Considering that based on NFPA guidelines (National Fire Protection Association, 2004) and existing standards regarding FDNY response times (Fire Department of New York, 2008a), a second paramedic in New York City would arrive extremely quickly to the scene to pair up with the first arriving paramedic.

If FDNY instituted alternative ambulance staffing it would immediately increase availability of existing paramedics. This would have financial, staffing, and work condition impact. More paramedics would mean less mandated overtime, decreasing department costs while avoiding paramedic burnout. A model deploying one EMT and one paramedic on most FDNY ambulances would guarantee that many more patients, regardless of call type, would have ALS on-scene quickly.

Some assignments that are initially dispatched as non-emergent due to communication misunderstandings or patient deterioration during unit response turn out to be just the opposite. There are many more fire stations than EMS stations in FDNY therefore more fire apparatus (CFR engines) available to participate in the tiered response system FDNY currently uses. The CFR engine as the first tier of response to critical assignments response time in 2007 was 4 minutes 19 seconds, but that is basic life support. Definitive ALS care arrived in 6 minutes 39 seconds (Fire Department of New York, 2008a). Both response times are good, but another model to consider places a paramedic on engine companies; response times to ALS assignments could drop dramatically.

Culturally, if a model was used that included a paramedic working with a basic life support firefighter, it could further the cooperation and integration between medical and suppression members, a union that since the merger in 1996 has been lacking in harmony between two disciplines used to working in independent agencies. Chief Peruggia disagrees; observing that pressing the crossover EMS members to fire suppression back into providing EMS when this is not why most joined the department is not in the department's best interest to place them on the same unit right now with EMS members. He feels that EMS paramedics and EMTs may someday be on the same unit in FDNY in the future but the alliance between EMS members and firefighters is still currently a bit tenuous to use a model pairing them together (J. Peruggia, personal communication, January 21, 2009).

The trend with EMS systems nationally based on the research is consideration of alternative ambulance staffing. Many departments already have this in place, as agencies

require members be cross-trained so they can multi-task and be available to perform a combination of fire suppression, basic life support, or advanced life support as needed (see Appendix C). A trend does not necessarily mean it is of lateral quality or an improvement, and the option of alternative staffing efficacy regarding affect on patient care awaits definitive studies and national comprehensive data collection. Alternative ambulance staffing as an option that provides effective patient care may be a solution to help FDNY remain contemporary and solvent.

Recommendations

Four recommendations include two models of alternate ambulance staffing for FDNY, a recommendation for future FDNY staffing, and student research recommendations:

1. Place one paramedic and one EMT on as many ambulances as resources allow.

Prior to full implementation a pilot program may be instituted in a limited area of New York City and data collected and analyzed for comparative results. This response model could be implemented in the short-term and would guarantee that most patients, including initially dispatched non-emergent ones, would have ALS quicker than previous response times indicate. Upon arrival and after patient assessment it is determined that the patient does not require ALS, the second ambulance that would have had to be sent with an additional EMT and paramedic to satisfy NFPA standards if it was an emergency that required ALS, could be cancelled and remain an available resource. The CFR program would remain in place as still the faster unit to arrive first to begin BLS care to critical patients.

2. Institute FDNY paramedic engines staffed with one paramedic and one EMT.

This model has been approved by the NYSDOH and resources are already available within the fire suppression discipline of FDNY. Members who were EMS EMTs or paramedics who crossed over to fire suppression but no longer operate as such may be used to staff the paramedic engines. The department would have to reinstate and maintain member certifications as it does now for EMTs and paramedics, and in addition open the department's internal paramedic training program to firefighters.

Since there are not enough crossover EMTs and paramedics to staff all the engine companies, efforts should be made to strategically place the paramedic engines in areas of highest ALS demand. CFR engine companies would continue to arrive first to critical patients in areas without paramedic engines. Following patient assessment, if the patient requires ALS the paramedic engine medical members would enable the traditional response of BLS and paramedic units to the scene to satisfy NFPA standards and would be the unit(s) of continued treatment and transport to the hospital. If the patient does not require ALS, only a BLS ambulance need respond for treatment and transport. The EMT and paramedic from the paramedic engine company in both situations would go back on the engine and become available.

A pilot for this model is also recommended as a medium-term project in deference to Chief Peruggia's observations regarding cultural challenges and the time it would take to reinstate the firefighters' medical certifications. The success or failure of the first model suggested may also impact on the decision to continue with alternative staffing.

3. Require prospective FDNY members have previous EMT or paramedic certification.

FDNY firefighter is a position that is easily filled; the civil service list is long and prospective members often wait years to be appointed. EMS has at times had difficulty filling classes. A long-term FDNY consideration that requires medical certification for job consideration would produce a workforce that is not limited to any single discipline and the requirement would allow for a feeder system of members into alternative staffing models. Following firefighting training, the firefighter/EMT or firefighter/paramedic would provide the department with opportunities to staff ambulances, fire apparatus, and paramedic engines with any multi-disciplined member.

There was initial resistance in FDNY when firefighters were trained as CFRs; they had to adapt to performing tasks removed from their desired work activities and core competencies. Members now entering the department as probationary firefighters are introduced to CFR immediately as part of their work experience, which may diminish resistance. Parallel to that, requiring medical certification to enter the department may diminish cultural conflict from the onset.

4. Future students researching alternative ambulance staffing may continue to analyze organizations that use alternative models.

The challenge of future research is to access data that definitively assesses EMS statistics on a broad scale to determine the likelihood of success, costs, and employee working conditions using alternative ambulance staffing. They could also explore hurdles such as labor/management negotiations regarding issues such as assignment differentials and job title adjustment.

References

2005 American Heart Association guidelines for cardiopulmonary resuscitation and emergency cardiovascular care (2005), *Circulation 112 (suppl)*, IV1-IV 211.

Bissell, R.A., Eslinger, D.G., & Zimmerman, L. (1998, January). The efficacy of advanced life support: A review of the literature. *Prehospital and Disaster Medicine, 13*(1), 69-71.

Cummins, R.O., Eisenberg, M.S., & Horwood, B.T. (1990, February). Cardiac arrest and resuscitation: A tale of 29 cities. *Annals of Emergency Medicine, 19*(2), 179-186.

Cummins, R.O., Ornato, J.P., & Thiess, W.H. (1991). Improving survival from sudden cardiac arrest: The "chain of survival" concept. A statement for health professionals from the advanced cardiac life support subcommittee and the emergency cardiac care committee. *American Heart Association, 83*(Circulation 1991), 1832-1846.

Eitel, D.R., Walton, S.L., & Guerci, A.D. (1988). Out-of-hospital cardiac arrest: A six-year experience in a suburban-rural system. *Annals of Emergency Medicine, 17*, 75-79.

Erich, J. (2008, November). Global perspectives: How our EMS counterparts in other lands are facing the challenges we all have in common. *EMS Magazine, 37*(10), 64.

Evans, B. (2005, October 1). Fire agencies need Fortune 500 recruiters. *Fire Chief, 49(10)*, 22-24.

Karter, M., & Stein, G. (2008, November). *National Fire Protection Association* (USS07) [Fire service statistics]. Retrieved January 11, 2009, from http://www.nfpa.org/itemDetail.asp?categoryID=417&itemID=18246&URL=Research%20&%20Reports/Fire%20reports/Fire%20service%20statistics

Lisberg, A., & Lombardi, F. (2008, September 24). Mayor Bloomberg wants to slice $1.5B from 2009, 2010 budgets. *New York Daily News.*

Ludwig, G. (2001, May). How many different ways can you perform EMS? *Firehouse*, *26*(5), 26.

Ludwig, G. (2004, December). Who needs paramedics? *Firehouse*, *29*(12), 24.

Ludwig, G. (2005, May). How many paramedics does it take... ? *Firehouse*, *30*(5), 32.

McDowell, T. (2002, August). An appropriate response. *Fire Chief, 46*(8), 20-21.

National Emergency Medical Service scope of practice model (pp. 24-28). (2007). Washington, D.C.: United States Department of Transportation National Highway Traffic Safety Administration.

National EMS Information System (Ed.). (2007, September) [Participating States]. Retrieved January 17, 2009, from http://www.nemsis.org/theProject/thePartners/participatingStates.html

National Fire Academy (Ed.). (2006, October). Organizational culture and change. *Executive Development Student Manual.* (pp SM 1-33). Emmitsburg, MD: National Fire Academy.

National Fire Protection Association. (2004). *NFPA 1710 Standard for the organization and deployment of fire suppression operations, emergency*

medical operations, and special operations to the public by career fire departments. Quincy, MA.

New York City Fire Department. (2008a). *FDNY vital statistics.* Retrieved December 13, 2008, from http://www.nyc.gov/html/fdny/html/stats/citywide.shtml

New York City Fire Department. (2008b). *EMS History: Part 1.* Retrieved December 19, 2008, from http://www.nyc.gov/html/fdny/html/ems_week/ems_history1.shtml

New York City Fire Department. (2008c). *EMS History: Part 2.* Retrieved December 19, 2008, from http://www.nyc.gov/html/fdny/html/ems_week/ems_history2.shtml

New York City Fire Department. [Benefits and salary]. (2008d). Retrieved December 29, 2008, from http://www.nyc.gov/html/fdny/html/community/ems_salary_benefits_042607.shtml

Regional Emergency Medical Advisory Committee of New York City (Ed.). (2006a, August). *Emergency medical technician protocols* (pp. C-6). NY: The Regional Medical Services Council of New York City, Inc.

Regional Emergency Medical Advisory Committee of New York City (Ed.). (2006b, August). *Emergency medical technician protocols* (pp. C-7). The Regional Medical Services Council of New York City, Inc.

Ross, L. (2007, October 18). Firefighter staffing at issue. *Albuquerque Journal.*

Steill, I. G. (2008). The OPALS major trauma study: Impact of advanced life support on survival and morbidity. *Canadian Medical Association Journal, 178*(9), 1141.

Steill, I.G. (2005, February). *Ontario pre-hospital advanced life support (OPALS) study* (pp. i-v). NY: Elsevier.

Steill, I.G., & Wells, G. (2004). Advanced cardiac life support in out-of-hospital cardiac arrest. *New England Journal of Medicine, 351*, 647-656.

Strategic Plan Work Group. (2007, February). *FDNY strategic plan 2007-2008* (p. 9). NY: Fire Department of New York.

United States Department of Labor Occupational Outlook Handbook. [Occupational employment and wages, paramedic]. (2007, May). Retrieved December 29, 2008, from http://www.bls.gov/oes/current/oes_nat.htm#b29-0000

United States Fire Administration (Ed.). (2009, February). *Strategic Plan.* Retrieved February 2, 2009, from http://www.usfa.dhs.gov/about/strategic/

Wilson, J. (2008, September). Budget crisis needs many team solutions. *Fire Chief*, *52*(9), 20.

Appendix A

National Emergency Medical Service Scope Of Practice Model

Certification	Hours of Training	Partial Skills Set
CFR	60	Airway management
		Patient assessment
		Illness and injury management
		Emergency childbirth
		Use of AED
EMT	110	Airway management
		Treatment of shock
		Fracture stabilization
		Use of AED
		Bleeding control
		Emergency childbirth
		Manage general medical complaints
Paramedic	1100	Drug administration via oral,
		intravenous, intraosseous (into bone),
		and intramuscular routes
		Endotracheal intubation (insert
		breathing tube into throat)

Insert gastric (stomach) tube

Take blood samples

Electrocardiogram (EKG) interpretation

Electrical interventions via manual defibrillator

Needle chricothyrotomy (clear a blocked airway)

Needle decompression (alleviate internal lung pressure inhibiting breathing)

Capnography (monitor respiratory gases)

Appendix B

FDNY Paramedic Questionnaire

For the purpose of this questionnaire only, "Alternative Staffing" = an AEMT-P (you) working with a lower certified partner on a **unit designated to deliver Advanced Life Support at the AEMT-P level.**

1) Have you as an Advanced Emergency Medical Technician-Paramedic (AEMT-P) on an **AEMT-P designated unit** ever worked with a lower certified member in a paid, private or volunteer service?

☐	Yes	41%
☐	No	59%

If you answered "No" to question #1, please skip to question #8

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2) What level of certification was the other crewmember? (May answer more than one)

☐	Advanced Emergency Medical Technician-Critical Care (AEMT-CC)	0%
☐	Advanced Emergency Medical Technician-Intermediate (AEMT-I)	0%
☐	Emergency Medical Technician-Basic (EMT-B)	100%
☐	Certified First Responder (CFR)	0%
☐	No Certification	0%

For questions 3-7, how much do you agree with the following statements?

3) I feel personally as confident working on an alternative staffed unit as with working with an equally certified partner.

Strongly Agree	Agree	Nuetral	Disagree	Strongly Disagree
8%	31%	31%	23%	8%

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4) The on-scene time was longer working on an alternative staffed unit.

Strongly Agree	Agree	Nuetral	Disagree	Strongly Disagree
0%	39%	46%	2%	0%

---

5) To be helpful to me in my delivery of Advanced Life Support, my partner performed skills that exceeded the limits of their training.

Strongly Agree	Agree	Nuetral	Disagree	Strongly Disagree
0%	31%	15%	23%	31%

---

6) I feel working on an alternative staffed ambulance has an adverse effect on delivery of AEMT-P patient care.

Strongly Agree	Agree	Nuetral	Disagree	Strongly Disagree
15%	31%	31%	8%	15%

7) I feel cross-over cultural differences adversely impact the quality of care delivered (example:

fire-service First Responder working with EMS service ALS provider).

Strongly Agree	Agree	Nuetral	Disagree	Strongly Disagree
0%	23%	23%	39%	15%

Please skip to questions *#13 and #14*

If you answered "No" to question #1, please continue with questions 8-14.

How much do you agree with the following statements?

8) I feel personally I would be as confident working on an alternative staffed unit as when working with an equally certified partner.

Strongly Agree	Agree	Nuetral	Disagree	Strongly Disagree
0%	37%	21%	21%	21%

9) I feel the on-scene time may be longer working on an alternative staffed unit.

Strongly Agree	Agree	Nuetral	Disagree	Strongly Disagree
42%	42%	11%	5%	0%

10) To be helpful to me in my delivery of Advanced Life Support, my partner may perform skills that exceed the limits of their training.

Strongly Agree	Agree	Nuetral	Disagree	Strongly Disagree
0%	16%	21%	21%	42%

11) I feel working on an alternative staffed ambulance may have an adverse effect on delivery of AEMT-P patient care.

Strongly Agree	Agree	Nuetral	Disagree	Strongly Disagree
42%	42%	5%	11%	0%

12) I feel cross-over cultural differences may adversely impact the quality of care delivered (example: Fire-service First Responder working with EMS service ALS provider).

Strongly Agree	Agree	Nuetral	Disagree	Strongly Disagree
31%	37%	16%	16%	0%

13) I feel alternative staffing is a viable option to deliver quality AEMT-P patient care.

Strongly Agree	Agree	Nuetral	Disagree	Strongly Disagree
0%	5%	16%	31%	48%

14) I have been an AEMT-P for:

☐	<1year	0%
☐	1-5 years	53%
☐	6-10 years	19%
☐	11-15 years	3%
☐	>15 years	25%

Additional Comments:

THANK YOU!

PLEASE RETURN THE QUESTIONNAIRE TO CHIEF OLSZEWSKI IN THE SUPPLIED ENVELOPE BY 11/15/08

Appendix C

Alternative Ambulance Staffing On-line Fire Department Manager Questionnaire

Q1. What is the name and location of your Fire and/or EMS Department? (Optional)

Answer Options	Response Percent
Name:	94.0%
City/Town:	94.0%
State:	100.0%

Q2. Which of the following best describes your Department?

Answer Options	Response Percent
Career (paid)	57.1%
Combination (paid/volunteer)	42.9%
Volunteer	0.0%

Q3. Does your Department have EMS delivery capabilities?

Answer Options	Response Percent
Yes	97.9%
No	2.1%

Q4. Does your Department deliver Advanced Life Support?

Answer Options	Response Percent
Yes	83.0%
No	17.0%

Q5. What level of certification are the members on the first arriving ALS unit?

Answer Options	Response Percent
All ALS	33.3%
Combination ALS with BLS, First Responder, or no certification.	66.7%

Q6. Why is the first arriving ALS unit staffed with a Paramedic and a lower certified member?
(May answer more than one)

Answer Options	Response Percent
Not in Department budget to staff first arriving ALS units with all ALS	36.0%
Difficulty recruiting Paramedics into my Department	32.0%
Difficulty retaining Paramedics in my Department	12.0%
Additional ALS responds from outside my Department	24.0%
Other	60.0%

Q7. How do you measure the effectiveness of mixed certification ALS units?
(May answer more than one)

Answer Options	Response Percent
Customer feedback	52.0%
Employee feedback	44.0%
Data from responses (time on scene, final patient disposition, etc.)	60.0%
My Department does not have evaluation in place for this.	28.0%
Other	20.0%

Q8. Has your Department found, with or without formal evaluation, that your paramedics are
comfortable with alternative staffed ALS units?

Answer Options	Response Percent
Yes	76.0%
No	12.0%
Not sure	12.0%

Q9. Has your Department found from a management perspective, with or without formal evaluation,
that alternative ambulance staffing is a viable option for delivery of quality ALS patient care?

Answer Options	Response Percent
Yes	84.0%
No	8.0%
Not sure	8.0%

Q10. How many total uniformed members are in your Fire Department?

Answer Options	Response Percent
1-50	28.0%
51-100	20.0%
101-250	16.0%
251-500	20.0%
>500	16.0%

Appendix D

FDNY Paramedic Questionnaire Cover Letter

FIRE DEPARTMENT
460 BRIELLE AVENUE STATEN ISLAND, N.Y. 10314
TEL. (718) 979-7175 FAX (718) 979-9788

EMS DIVISION 5

TO: EMT/P (Name) Station (#)

FROM: Janice Olszewski Deputy Chief Division 5

DATE: October 22, 2008

SUBJECT: Questionnaire

Can you please help me by completing the attached short questionnaire? It is for a paper for a class called the Executive Fire Officers Program that I am attending at the National Fire Academy in Emmitsburg, Maryland. The topic of my paper is "Consideration of Alternative Ambulance Staffing."

The focus of the paper is how alternative staffing may affect the delivery of patient care. It is a project completely independent from FDNY operations and is solely for use in my paper.

Your opinion is important not only for my paper, but adds a voice to assist EMS systems nationally who struggle to find the optimal method to deliver patient care among approximately 80 different configurations in which to deliver it to citizens.

Participation is anonymous, however, I am available to discuss the topic with you further if you would like to. Upon completion of the questionnaire, please place it in the provided envelope addressed to me at Division 5 and place it in the bag mail.

Thank you in anticipation of your help.

/JO

Appendix E

On-line Manager Questionnaire Respondents

Respondents,"Response Date","Name:","City/Town:","State:"

1,11/18/2008 10:49:00 PM,"Las Vegas Fire & Rescue","Las Vegas","NV"
2,11/19/2008 1:21:00 PM,"Prince William County Dept of Fire and Rescue","Woodbridge","VA"
3,11/19/2008 4:19:00 PM,"Memphis Fire Department","Memphis","TN"
4,11/29/2008 4:34:00 PM,"Medic EMS","Davenport","IA"
5,11/29/2008 4:35:00 PM,"Atlanta Fire Department","Atlanta","GA"
6,11/29/2008 4:35:00 PM,"Riverdale Fire Department","Riverdale","IA"
7,11/29/2008 8:19:00 PM,"Gulfport Fire Department","Gulfport","MS"
8,11/30/2008 3:35:00 PM,"Lenexa Kansas Fire Department","Lenexa","KS"
9,11/30/2008 8:27:00 PM,,,"MD"
10,11/30/2008 8:59:00 PM,"Alexandria Fire District","Alexandria","KY"
11,12/1/2008 6:15:00 PM,"Dave Grunes","Bedford","MA"
12,12/1/2008 6:22:00 PM,"Lansing Fire Department","Lansing","MI"
13,12/1/2008 8:24:00 PM,"Denver","Denver","CO"
14,12/1/2008 8:32:00 PM,"Colwich Fire Department","Colwich","KS"
15,12/1/2008 9:41:00 PM,"Kalispell Fire Department","Kalispell","MT"
16,12/1/2008 9:46:00 PM,"Lawrence E. Tan","New Castle","DE"
17,12/2/2008 2:14:00 AM,"Cedar Rapids Fire Department","Cedar Rapids","IA"
18,12/2/2008 6:03:00 AM,"Novato Fire Protection District","Novato","CA"
19,12/2/2008 1:22:00 PM,"Old Mystic Fire Dept","Old Mystic","CT"
20,12/3/2008 6:31:00 PM,"Anchorage Fire Department","Anchorage","AK"
21,12/3/2008 7:00:00 PM,"Nampa Fire Department","Nampa","ID"
22,12/3/2008 11:16:00 PM,"San Francisco Fire Department","San Francisco","CA"
23,12/4/2008 6:55:00 PM,"Brad Dougherty","Miami","FL"
24,12/5/2008 5:27:00 PM,"Barbourville Fire Department","Barbourville","KY"
25,12/5/2008 10:54:00 PM,"Logan Fire Department","Logan","UT"
26,12/5/2008 11:08:00 PM,"Murray City","Murray","UT"
27,12/5/2008 11:08:00 PM,"Port Ludlow Fire & Rescue","Port Ludlow","WA"
28,12/6/2008 12:09:00 AM,"Robert McCaughan","Pittsburgh","PA"
29,12/6/2008 6:06:00 AM,"Mark Miller","Cambria","CA"
30,12/7/2008 7:16:00 PM,"Chopmist Hill Fire Department","Scituate","RI"
31,12/8/2008 2:17:00 PM,"East Providence Fire Department","East Providence","RI"
32,12/8/2008 3:40:00 PM,"Aberdeen Fire Department","Aberdeen","WA"
33,12/8/2008 6:40:00 PM,"Jon Petroskey","Antigo","WI"
34,12/8/2008 9:18:00 PM,"Colonial Heights Fire/EMS","Colonial Heights","VA"
35,12/9/2008 1:14:00 AM,"Jo-Ann Lorber","Fort Lauderdale","FL"
36,12/9/2008 5:47:00 PM,,,"VT"
37,12/10/2008 5:42:00 PM,"Baltimore City Fire Department","Baltimore","MD"

38,12/11/2008 12:21:00 AM,"City of Cudahy Fire Department","Cudahy","WI"
39,12/11/2008 1:08:00 AM,"Fresno Fire Department","Fresno","CA"
40,12/12/2008 9:36:00 PM,"Boston EMS","Boston”,"MA"
41,12/15/2008 11:06:00 PM,"Brookings Fire/Rescue","Brookings","OR"
42,12/18/2008 6:06:00 PM,"Tempe Fire Department","Tempe","AZ"
43,12/19/2008 5:11:00 PM,"Houston Fire Department","Houston","TX"
44,12/19/2008 5:16:00 PM,"Glendale Fire Department","Glendale","AZ"
45,12/19/2008 6:45:00 PM,"Virginia Beach Department of EMS","Virginia Beach","VA"
46,12/23/2008 1:02:00 AM,"Randy Journigan","Virginia Beach","VA"
47,12/26/2008 10:31:00 PM,"Westminster FD","Westminster","CO"
48,12/27/2008 12:38:00 AM,"Chesterfield County Fire and EMS","Chesterfield County","VA"
49,12/29/2008 10:45:00 PM,,,"VA"
50,12/30/2008 1:58:00 PM,"Stuart Fire Rescue","Stuart","FL"

Appendix F

Interview Questions: John Peruggia, Chief of FDNY-EMS

1) Many career Fire Departments that provide EMS have resorted to alternative ambulance staffing. Why do you think this is so?

2) Did FDNY ever consider alternative ambulance staffing? What configuration(s)?

3) If so, why has it not been implemented?

4) Do you feel alternative ambulance staffing is a viable option for the future in FDNY? Why or why not?

5) Do you feel FDNY paramedics would be receptive to alternative staffing, working with EMS Supervisors, EMTs or CFRs?

6) Many EMTs and paramedics have crossed over to Fire Suppression. Do you feel they may be utilized, for example, to create response units such as Paramedic Engines?